Clinton, U.S. On January 13, M. Borrelly, at Marseilles, also found a small planet distinct from that of Perrotin and Peters. It is remarked in M. Leverrier's *Bulletin*, that the first of these planets is unlikely to be Frigga, since the rough ephemeris in the *Berliner Jahrbuch* gives a contrary motion in declination. The object found by M. Borrelly, however, presents indications of identity, though a considerable correction of the elements of Frigga, brought up to 1874, December, by Dr. Powalky, would be required. If we employ these elements it will be found that with $\delta M = - 3^\circ\ 17'{\cdot}67$, the computed and observed longitudes of Borrelly's planet on January 13 will agree, but there is an outstanding difference of $+ 1^\circ\ 39'$ between the latitudes. The comparisons with the observation on this date and one on January 15, are as follow:—

	Long. c − o	Lat. c − o
January 13 ...	0′·0 ...	+ 1° 39′·1
„ 15 ...	− 4′·4 ...	+ 1° 36′·9

NOTES

THE eminent physicist, Prof. J. C. Poggendorff, for many years professor in the Berlin University and editor of *Poggendorff's Annalen*, has died in Berlin, in his 81st year. We hope to be able to give a memoir of Prof. Poggendorff next week.

THE eminent Belgian botanist, Prof. Bellynck, died at Namur in December.

THE first four names in the Cambridge Mathematical Tripos list, are Messrs. Donald McAlister, St. John's, Frederick M. de M. Gibbons, of Gonville and Caius College, R. C. Rowe and Mr. James Parker Smith, both of Trinity College. The Senior Wrangler, who was born at Perth in May, 1854, has had a most distinguished career as a student.

THE Society of German Naturalists and Physicians holds its annual session at Munich, February 18, and celebrates at the same time its fiftieth anniversary.

THE Council of the Royal Dublin Society have elected William Archer, F.R.S., Secretary for Foreign Correspondence to the Royal Irish Academy, as head of their Library Department, and the members of the Society, as well as the literary and scientific public in Dublin are to be congratulated on the occasion.

THE Russian Archæological Society holds its Annual Congress at Kasan, July 31.

ACCORDING to a Report of the French Minister of Public Instruction, the salaries of the Inspectors-General of Public Instruction, the Professors of the Collége de France, and the Professors of the Museum of Natural History, have been raised to 10,000 frances, and of the Professors of the School of Living Oriental Languages, to 7,500 francs.

IN 1855 Napoleon III. proposed a prize of 50,000 francs for the most important improvement made in the use of voltaic electricity during the previous ten years. The prize was last awarded to M. Ruhmkorff, who, it is known, is a German physician established in Paris. M. Waddington has recently appointed a jury to award the prize for the third time. Any improvement in any industry using voltaic electricity comes within the competition, consequently the sphere is a very wide one. Regulations will shortly be issued.

PROF. NORDENSKJÖLD proposes to take command of an expedition next year which will examine the Siberian coast from the mouth of the Jenissei to Behring Straits. The return journey will be by way of China, India, and the Suez Canal.

THE remarkable entomological collections of the late Dr. Breyer are to be purchased for the Royal Museum for Natural History of Brussels, for the very low price of 240*l*. They contain above 21,000 specimens of insects, classified by the late eminent entomologist.

WE observe that the following honorary members have been elected by the New York Academy of Sciences:—In this country, Mr. G. Bentham and Prof. Boyd Dawkins; on the Continent, Profs. Brandt, De Candolle, Milne-Edwards, Hoffmann, M. de Verneuil, and Herr von Siebold.

WE have lately alluded to the very large ethnographical additions made to the Berlin Museum by Dr. Lenz, Dr. Bastian, and Dr. Jagor. A still more valuable collection has lately been presented by Dr. Nachtigal, and is now in process of arrangement. It embraces a vast variety of objects gathered amidst widely-diversified tribes by this well-known traveller during his last extensive tour through Africa, and affords a rare opportunity for comparative ethnographical study.

A CREDIT of 13,668*l*. has been requested from the Belgian Chamber of Representatives by the Minister of the Interior, for the astronomical and meteorological observatory of Brussels. Besides the construction of new astronomical and magnetical instruments, this sum will be used for the enlargement of observations upon the periodical phenomena of vegetation. Special arrangements will be made for carrying on the observations in the garden of the observatory, on plants especially selected for the purpose from the double point of view of the botanical geography of the present time, and of the study of former climates of the earth.

THE Belgian Chamber of Representatives passed, on January 26, a resolution of great importance to geologists, allowing the necessary sums for the publication, first, of the beautiful coloured maps of the soils and sub-soils of Belgium, prepared about thirty years ago by André Dumont, on the scale of 1 : 160,000, and which are long ago out of print; and second, of the MSS. of Dumont, with his numerous geological sketches and drawings, and of the numerous notes he took during his travels in Belgium. The MSS., which were purchased by Government, are already arranged for publication, and their appearance, as well as that of the maps, is expected about the end of this year.

THE Belgian Geological Society is engaged in the elaboration of a scheme for the preparation and publication of a detailed geological map of Belgium, on a large scale. The idea of such a publication being already approved by the government, the point under discussion now is the best means of engraving the work, and the Society proposes to entrust the task to two special committees, geological and cartographical; both committees will be placed under a common directorship.

AT the session of the Berlin Anthropological Society on January 20 Prof. Virchow gave an extended account of a large collection of diluvial remains found in the neighbourhood of Weimar. They consisted of the bones of such animals as the elephant, rhinoceros, arctic bear, deer, wild swine, &c. Apart from their palæontological value, they are extremely important from an anthropological point of view, as among the bones are several flints, remains of fires, and peculiarly divided fragments of bone, all indicating the presence of man in company with the animals mentioned. Dr. C. Jung described the superstitious observances and use of charms and amulets among the aborigines of Australia. The bones of animals which have been eaten, or the bones of dead relatives are regarded with peculiar reverence by almost all of the tribes. There was also a discussion on the supposed Phœnician inscription lately found on a block of stone in North Russia, Dr. Wettstein declaring it impossible to connect it with known Phœnician characters.

IN the January session of the Swedish Anthropological Society H. Torell gave the results of an interesting comparative study of the Esquimaux and Japanese. The anatomical and ethnographical resemblances are so striking that they give additional strength to the theory of the settlement of America from Asia by the way of Behring's Straits.

H. V. SCHLAGINTWEIT-SAKÜNLÜNSKY publishes, in connection with his report on the botany of the Himalayas, presented before the Berlin Academy of Sciences, an interesting comparison between the snow limits of the great Asiatic mountain chain and those of the Swiss Alps. The Himalaya range shows a snow limit at the height of 16,600 feet on the northern side, and 16,200 feet on the southern side. That of the Kuenlun range varies from 15,100 feet on the northern side, to 15,800 on the southern. The snow limit of the Alps shows an average height of 9,000 feet, 8,900 feet on the northern side, and 9,200 feet on the southern.

IN the last session of the Austrian Meteorological Society, Prof. A. von Obermayer read a paper on the nature of fogs, strongly advocating the theory regarding them as minute drops of water, the specific gravity of which is overcome by the friction between the particles of air, according to Stokes's hypothesis.

IN a communication in the *Daily News* of January 25, in reference to the Cairo Geographical Society, by the Alexandria Correspondent of that paper, some interesting details are given of papers read on the Eastern Sudan and on Darfur.

THE use of rock crystal for normal scientific apparatus has recently been advocated by S. Stein, of Bonn, in a communication to the German Chemical Society. For scale-beams and scale-pans it is especially adapted, as it is entirely unaffected at ordinary temperatures by acids, bases, or the gases and moisture present in the atmosphere, while possessing nearly the same specific gravity as aluminium—2·65—and being comparatively unelastic. It is equally practicable for standards of measure, longitudinal as well as circular. Discs to be used for telescopes, theodolites, quadrants, &c., if cut at right angles to the chief axis, show an almost absolute unchangeability of form. The smallness of the coefficient of expansion renders it also eminently well fitted for normal thermometers, where accuracy and not cost is the chief requisite.

COMMANDER CAMERON having been invited by the Geographical Society of Paris to deliver a lecture on his journey across Africa did so at an extraordinary meeting held by the Society in the large hall of the Sorbonne, on January 26. The place, although fitted to accommodate 2,000 people, was crowded to inconvenience. On Saturday a banquet was given to Commander Cameron by the Fellows of the Geographical Society, about 200 being present. The President of the Republic was represented by his first aide-de-camp, the Marquis D'Abzac, and the Minister of Public Instruction by his general secretary, M. Watteville, who delivered to Commander Cameron the University gold palms and diploma. The knife and fork used by Livingstone in his African travels, and which had been purchased by MM. Rambaud, the large French traders established in Zanzibar, and presented to the Geographical Society of Paris, were used by Cameron. A magnificent album of the portraits of all the persons present at the banquet will be sent to Commander Cameron. MM. Hachette and Co. are preparing a magnificent French edition of Cameron's work.

AT the session of the Berlin Academy of Sciences on January 25, Prof. Du Bois-Reymond gave a report of the investigations carried on in connection with the Humboldt foundation intrusted to the Academy. At present two travellers are supported by the funds—Dr. Hildebrandt, who is studying the snowy regions of the Kilimanjaro Mountains in Eastern Africa, and Dr. C. Sachs, engaged in researches in Brazil on the nature of the electricity of the electric eel.

A PIECE of burnt stone resembling a piece of partially burnt slate coal, with white sparkling specks on it, fell at Ecclefechan on the evening of the 2nd January. Two men, walking on the Glasgow road, heard a noise behind them, and on turning round they found the stone referred to embedded in the ground to the extent of half-an-inch or more. One of them attempted to lift it but got his hand burnt. The stone, which measures about four inches by two, and weighs nine ounces, took twenty minutes to cool. A volume of smoke proceeded from it.

A FEW years since, M. Delacour, sub-director of the Danish Meteorological Institute, invented the so-called phono-telegraphic system. Since then he has carried on an extensive series of experiments, the cost of which has been defrayed by the Danish Government, with the view of perfecting the new system. The results of his investigations were displayed a few days since to a company of electricians and members of the Danish Parliament. As is already known this system is based upon the application of vibrating currents, tuning-forks of the same number of vibrations per second being brought within the influence of current at both ends of the wire. M. Delacour made use on the above occasion of twelve different pairs of tuning-forks, all of which were connected at the same time with a single telegraphic wire. He was then able to send simultaneously twelve messages by means of the tuning-forks as well as one by the ordinary method, and most satisfactorily solved the problem with regard to the use of a single wire for the forwarding of numerous messages at the same time.

PROF. ANTON KERNER, author of the "Means of Protection in Flowers against Unwelcome Visitors" (NATURE, vol. xv. p. 237), has lately received from Charles Darwin the following characteristic epistle:—"Allow me to express to you my heartiest thanks for the pleasure experienced in reading your work. You have opened up an entirely new field of research, and explained many things which were previously enigmas to me. I find that I have fallen into many mistakes, in the preparation of my last book, when touching upon the subject which you have considered so fully."

THE last number of the *Jahrbuch der k. k. geologischen Reichsanstalt* (vol. xxvi. No. 3) contains a very valuable elaborate paper by K. M. Paul—"Grundzüge der Geologie der Bukowina" —with a map on a scale of 1 : 280,000, reduced from that of the Geological Survey, and embodying the results of the survey, made during the last four years, together with the data furnished by former explorations. The southern, hilly corner of the Duchy is occupied by an island of crystalline rocks, bordered on one side by a zone of mesozoic limestone (Dyas and Trias). A broad zone of the so-called Carpathian sandstones (Neocomian, Gault, and Upper Chalk, and probably Eocene) follows, as is generally the case at the northern slope of the Carpathian, and crosses the land in a north-western direction. Further to the north-east we see a broad district covered with Neogene formations (Lower and Upper Mediterranean, and Garmathian stages), diluvial deposits, and loess, which district meets with the Galician plains to the west, and the Podolian to the north.

THE geological structure, and especially the volcanoes of the southern parts of Luzon (Philippines) are the subject of an interesting note by Dr. Drasche, being a preliminary report upon his recent travels in the interior of the island, which appeared in Tchermak's *Mineral. Mitth.*, 1876, Heft 3. The note is accompanied by a map on the scale of 1 : 1,000,000, constructed after that of M. Jagor ("Reise in den Philippinen") and by some views and geological sections. The volcanoes of the Taal district, the Majajai, the Monte Labo, and Sierra Corasi, the Ysarog, Buhi, and Mayon, or Albay, were visited by the author, and are shortly described. Among other interesting observations we notice the very steep slopes (32°) on which lava-floods may flow sometimes without being interrupted for distances of more than 300 feet, observed on the Mayon. The height of this last being 2,374 metres (7,787 feet), Dr. Drasche points out the error in the index of volcanoes, given in the late Mr. Poulett Scrope's work, where the height of the Mayon is given as 3,200 English feet. Another error of the Index is that an active volcano is reported to exist on "the little island Mindoro," whilst on this rather large island (250 square geographical miles) there are no volcanoes at all, neither active nor extinct.

IN a communication to the Vienna Academy on the nature of gas molecules, M. Boltzmann abandons the notion that they behave like aggregates of material points (the atoms). He considers that in estimating the impact action of the molecules, we may almost regard the whole aggregate, which we denote as an individual gas molecule, and which may consist of different substances, perhaps even ether atoms, as rigid. It is found that then the ratio of the heat-capacities of the gas must be $1\frac{2}{3}$, when the gas molecules have ball-form. The ratio of the heat-capacities will be 1·4 if the molecules have the form of rigid bodies of rotation, but which are not balls; and $1\frac{1}{3}$ if they are of any other form of rigid bodies. These numbers at least seem to agree so far with those found experimentally, that one cannot say that experiment furnishes a contradiction of the theory thus modified. It is further shown that the values experimentally got for the heat-capacity, under this view, are in satisfactory agreement with the heat-capacities of solid bodies. Of course the gas molecules cannot be absolutely rigid bodies; this is already disproved by spectral analysis, but it may be that the vibrations producing gas spectra are merely brief shiverings during the shock of two molecules, comparable to the sound perceived on the shock of two ivory balls.

THE current opinion as to the Ural range not bearing any traces of former glaciers, is now contradicted by M. Poliakoff. This explorer, who has had during the last ten years many opportunities of making a close acquaintance with glacial formations in Southern Finland, in the basin of Lake Onego, and on the Valdai plateau, reports that, while the lower parts of the Ural ridge are connected under large alluvial deposits, its upper parts, especially east of the water-parting, exhibit unmistakable morainic deposits with scratched boulders. The rocks bear also, sometimes, true glacial striae running from north-west to south-east, and certainly such striae would be found more numerous, were the localities more thoroughly explored than M. Poliakoff could do as he crossed the ridge on his way to the Obi. A lower secondary ridge, the last crossed by the highway before Ekaterinburg, exhibits also many *traînées* of immense boulders running in parallel directions, such as are found in Finland, Erthonia, and northern Russia. Further east, on the shores of the Obi (near to the mouth of the Irtysh), the lowest parts of the loose deposits, which are roughly stratified sands, contain a good deal of well-polished and striated boulders of glacial origin. These observations make it very desirable that the Ural were thoroughly explored by a geologist well acquainted with glacial formations.

THE Göttingen Academy announces the following subject for prize competition in the physical class till November, 1878:—The question what special actions (if such there be) breathing in pure oxygen gas of the ordinary density of atmospheric air has on the animal organism, has not hitherto been answered by researches with sufficient agreement. Further researches, therefore, are desired, both on homoiothermal and, as far as practicable, on poikilothermal animals; in these should be shown, quite specially, along with the phenomena externally observable in the animals, the nature of the change of blood and material (excretion of carbonic acid, nature of urine). In the view of certain data, the purity of the oxygen from all foreign matters occurring in its preparation must be carefully looked to, while a mixture of atmospheric nitrogen within narrow limits, hardly to be avoided, would not essentially vitiate the results. In the mathematical class of the same Academy, new researches are desired on the nature of the unpolarised light-ray, calculated to bring the ideas regarding natural light from any source, near to those which theory connects with the different kinds of polarised light.

WE have received the Fourth Report of the New Cross Microscopical and Natural History Society, which, we are glad to see, continues to prosper. It contains an address by the president, Dr. F. T. Taylor, on "Spontaneous Generation."

FROM the Seventh Annual Report of the Wolverhampton Free Library Committee, we are glad to learn that a Naturalists' and Archæological Department has been established in connection with that institution.

IN 1875 a Bedfordshire Natural History Society was formed, and it has just issued its first Abstract of Proceedings. It has made a very fair beginning both as to numbers and as to the quality of the papers read. We hope it will receive more encouragement from residents in the county than it appears to have done, and that it will work diligently at local natural history. One of the papers, accompanied by a map, is "On the Botanical Division of Bedfordshire," by Mr. W. Hillhouse, F.L.S.

AMONG the papers in the *Proceedings* of the Belfast Natural History and Philosophical Society for 1875-6, is one by Mr. J. J. Murphy on the Glacial Climate and the Polar Ice-cap. Mr. R. Lloyd Patterson has a concluding note on some of the swimming birds of Belfast Lough.

THE additions to the Zoological Society's Gardens during the past week include two Vervet Monkeys (*Cercopithecus lalandii*) from South Africa, presented by Mr. T. G. Butler; two Arctic Foxes (*Canis lagopus*) from the Arctic Regions, presented by Sir Thomas Erskine, Bart, F.Z.S.; a Ring-Necked Parrakeet (*Palæornis torquata*) from India, presented by Miss Smith; three Silky Marmosets (*Midas rosalia*) from Brazil, purchased.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 21, 1876.—"On the Rotation of the Plane of Polarisation of Light, by Reflection from the Pole of a Magnet," by George Francis Fitzgerald, M.A. Communicated by G. Johnstone Stoney, F.R.S.

At the last meeting of the British Association, the Rev. J. Ker described a delicate and very remarkable experiment, from which it appeared that when plane polarised light is reflected from the polished surface of the end of a powerful magnet, the plane of polarisation is rotated. Mr. Geo. F. Fitzgerald has recently communicated to the Royal Society an explanation of this curious phenomenon, of which the following is an abstract:—

It is known from Faraday's and Verdet's experiments that when plane polarised light is transmitted through transparent diamagnetic or ferro-magnetic media, while under the influence of a powerful magnet, the plane of polarisation will be rotated, so that the plane of polarisation of the emergent beam will differ from that of the incident light. This action is most powerful when the direction of transmission coincides with the direction of the streams of magnetic influence, and in general the rotation is in opposite directions in diamagnetic and in ferro-magnetic media. Now, if we regard the incident light as formed of the two circularly polarised beams which are equivalent to it, we learn from Faraday's and Verdet's experiments that one of these beams is